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EFFECT OF CONSENTRATION OF COCONUT SHELL LIQUID SMOKE AND PROPORTION BANDENG FISH: " POYA " TO QUALITY AND SHELF LIFE OF " OTAK-OTAK" BANDENG

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Abstract

" Otak-otak bandeng " is one of the semi-moist food product are susceptible to damage, caused by the growth of microorganisms and rancidity. " otak-otak bandeng " are made fish processed by adding poya, eggs and spices. The addition of liquid smoke of coconut shell aimed at inhibiting the growth of microorganisms and prevent rancidity.
The objective of the research to understand the effect concentration of liquid smoke of coconut shelf, and proprortion bandeng fish " poya " to quality and shelf life " otak-otak bandeng "
The research was conducted in two step; the first step I uses the Randomized Design completely (RDC). single factor with four replication. The first treatment is the proportion of bandeng fish " poya " ; ie : (50%:50%; 60%:40%; 70%:30%; 80%:20%; 90%:10%).
The best result of the first treatment continued to the second step with the treatment concentration of coconut shell liquid smoke ; ie : (0%, 0,25%, 0,50%, 0,75%, 1%.). The best result was obtained on the treatment of proportion of fish " poya " (80%:20%) that produces content protein and fat are of 20,575%, 17,7225% respecstively and the value of Aw 0,7266.
The best of the final treatment was showed on the liquid smoke concentration 0,75% of consumer preferences of the highest ranking at 59,5 (taste) and 57 (aroma)
***Keywords** : Bandeng fish, spices, " otak- otak "*

1. INTRODUCTION

Bandeng fish is a fish species that live on the surface of the sea. Have fish meat white and red, each containing a different composition. The red meat contains a lot of fat, while the white meat contains more protein.
" Otak-otak" is one of the products processed from fish material. In general, the "Otak-otak" interpreted as a traditional food made from fish meat that has been chopped, mashed and flavored with spices, eggs and fillers are " poya" (grated coconut is roasted and then mashed), then inserted into the skin of the fish and carried out steaming.
The quality of the"Otak-otak" of bandeng fish was determined by appearance, texture and flavor all of which were influenced by the type of fillers, binders and processing methods. "Poya" used as fillers, binders and processing methods. Poya is used as filler material in the manufacture of products "Otak-otak", because it can affect the fat content and improve texture. The proportion of fish: the right" poya"."Otak-otak" obtained banding quality. Proportion "poya" too much, will get a hard texture and appearance is not good, where as when the proportion "poya" too little, the texture will be mushy.
Product "Otak-otak" are very susceptible to damage, prevention of damage to the "Otak-otak of meetfish products, primarily to prevent microbial growth and the onset of rancidity, among others, can be done with the addition of preservatives, such as liquid smoke shells. The results yulistiani (1997) Demonstrating antimikrobia coconut shell liquid smoke has the greatest activity against pathogenic bacteria and bacterial destruction in beef compared with liquid smoke teak, wood bingkarai, kruing, lamtoro, mahogany, camfer and glugu. The addition of coconut shell liquid smoke s into the"Otak-otak of the product is expected to help maintain the durability of the product.
Hadiwiyoto (1993) based on the protein in meat, the protein can be classified into three kinds, namely the sarcoplasmic proteins, miofibrilar and connective tissue and stroma. Suzuki (1981) states that miofibrilar protein is a protein made by the myofibril-containing myosin, actin-actin and proteins regulasi. miofibrilar among 66-77% of the total protein in fish meat and has an important role in the formation of gel when pengumpalan and processed meat . Girard (1992) suggested that the chemical components in the smoke is very involved in product quality nenentukan fumigation because apart form the flavors, textures, and colors are typical, fogging may also inhibit damage to products resulting from the oxidation process and growth mikroorganisme.Pszczola (1995), suggests that two main compounds in liquid smoke are known to have bactericidal effects / bacteriostatic are phenols and organic acids. Both compounds effectively they will work together to control microbial growth, and therefore contributes to the shelf life of product fumigation.

RESEARCH AND METHODOLOGY

Materials and Equipment

The materials used for the manufacture of products: liquid smoke shells, fish, coconut, eggs, spices.

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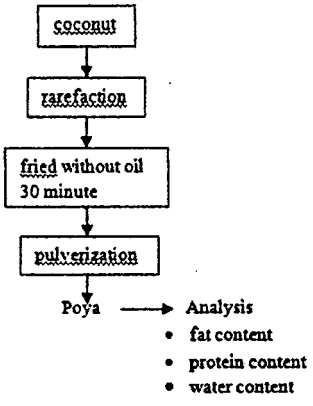
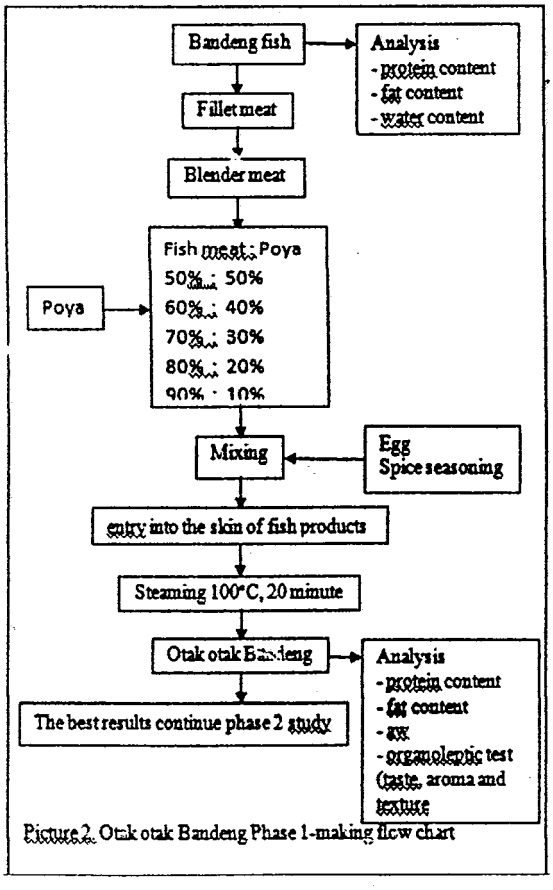
Research Methods

The study was conducted in two phases. Phase I using Completely Randomized Design (CRD) with a 4X single-factor test, analyzed by analysis of diversity (variable change in stage I, namely: Proportion of fish meat with" poya"; 50%: 50%, 60%: 40%, 70%: 30 %, 80%: 20.90%;! 0%). If there is a difference made Smallest Real Difference Test (LSD) 5% (Suntoyo, 1993). The best results followed a phase II study.

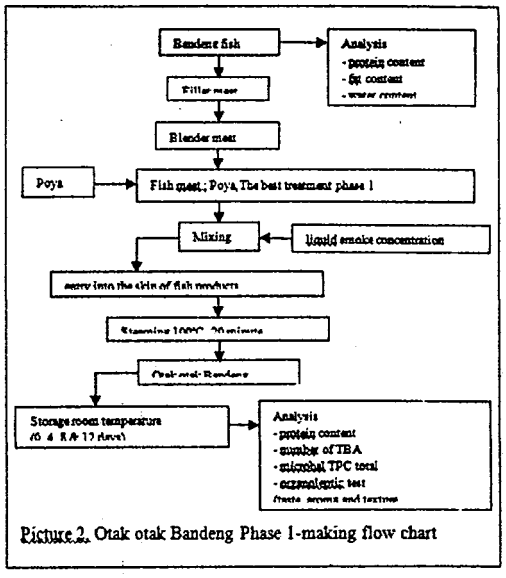
RESEARCH PROCEDURE: FLOW CHART MAKING



Picture 1. Poya-making flow chart



Picture 2. Otak otak Bandeng Phase 1-making flow chart



Picture 2. Otak otak Bandeng Phase 1-making flow chart

THE RESULTS AND DISCUSSION

A. Raw Materials

Table 1. Results Analysis of Raw

Materials	Material moisture content (%)	Protein (%)	Fat (%)
Bandeng fish	18.91	72.4	4
"Poya"	16	4.2	33.3

Table 1 shows the results of analysis of sea bass 72.4 water content, protein content 18.9%, 4% fat content. Results of analysis they will be supported by Hadiwiyoto (1996) that the protein content of fish: 12% - 20% while the fat content of fish from 2.5 to 8%. To poya water content of 16%, levels proteian 4.2%, 33.3% fat content. High levels of fat in poya caused poya made from coconuts has a fat content of 13% - 33% and 4% protein (Kataren, 1986). Chemical composition that is high is expected to provide higher value to the product"Otak-otak" bandeng.

Table 2: Results of analysis dough "Otak-otak"bandeng

Dough"Otak-otak bandeng		Content of water	content of protein levels	content of fat
Spices	Bandeng fish : "Poya"			
30 gr	50 : 50	64,25	19,96	25,04
30 gr	60 : 40	62,27	20,16	23,49
30 gr	70 : 30	61,60	21,56	21,52
30 gr	80 : 20	60,47	22,39	20,57
30 gr	90 : 10	60,38	22,86	18,86

Results dough"Otak-otak bandeng obtained moisture content ranged from 60.38 to 64.25%, protein levels 18,88 to 25.03%. During the observation of storage temperature and RH penimpanan storage space.

Table 3: Observations of storage temperature and storage RH brains of banding with a coconut shell liquid smoke concentration 0.75%

Type of Analysis	Observations (days to)			
	0	4	8	12
Suhu (° C)	28	29	30	30
RH (%)	68	72	75	76,5

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B. "OTAK-OTAK" BANDENG PRODUCTS

I. Observation Phase I

a. Protein levels

The results of the analysis of statistics, it is known that the treatment the proportion of bandengfish:" poya" significant effect (≤ 0.05) on levels of protein

Table 4: Average value of protein levels by treatment with bandengfish: "poya"

Treatment of fish: poya	Average protein content (%)	Notation	BNT 5%
50 : 50	18,94	a	0,085
60 : 40	19,69	b	
70 : 30	20,49	c	
80 : 20	20,36	c	
90 : 10	20,78	d	

Description: average value of which was accompanied by a different letter stating no significant difference ($p \leq 0.005\%$)

Table 4 shows that the greater proportion ofbandeng fish is increasing. This is due to protein levels from "Otak-otak"bandeng is higher than the levels of protein" poya." Hadiwiyoto (1996) and Ketaren (1986) suggest levels of protein from fish 12% - 20%, protein content "poya" 1% - 4%.

b. Fat Content

Statistik analysis results, it is known that the treatment proportion bandeng fish: "poya" significant effect ($p \leq 0.05$) on levels of fat

Table 5: Average proportion of fat content with the treatment ofbandeng fish: "poya"

Treatment Bandeng fish : Poya	Average fat content (%)	Notation	BNT 5 %
50:50	24,35	d	0.1605
60:40	19,36	c	
70:30	17,83	b	
80:20	17,72	b	
90:10	14,67	a	

Table 5. shows that the greater proportion of bandeng fish and the smaller proportion of fat levels "poya" the "Otak-otak"bandeng declined. This is due to fat content of "poya "higher than the levels of fatty fish. This is in accordance with Ketaren (1986), coconut fat content 12% - 30%, while the fat content of fish 35% - 8%. (Hadiwiyoto, 1986)

c. Water Activity

The results of statistical analysis, it is known that the proportion of bandeng fish treatment:" poya "significantly affect water activity (Aw)

Table 6: Average Value - average Aw with treatment proportion bandeng fish:" poya"

Treatmentikan bandeng : poya	Average	Notation	BNT 5 %
50 : 50	0,6885	a	0,0106
60 : 40	0,7048	b	
70 : 30	0,7168	b	
80 : 20	0,7266	b	
90 : 10	0,7380	b	

RESEARCH STAGE 2

a. Total microbes

Total microbial analysis carried out every four days for 12 days at room temperature storage.

Table 7: Effect of concentration of liquid smoke shells on the growth of microbes in the "Otak-otak"bandeng with storage at room temperature

Total microbial log Cfu/mg	Shelf life storage			
Liquid Smoke constructive retention	0	4	8	12
0%	0	2,176	5,230	6,568
0,25%	0	2,954	4,146	5,397
0,50%	0	2,397	3,041	5,954
0,75%	0	1,146	2,380	4,079
1%	0	0	1,903	2,845

The greater the concentration of liquid smoke added to the total microbial getting smaller, and the longer storage of the total microbes will increase. This is due to liquid smoke coconut shell is a very effective antimicrobial compound in inhibiting the growth of microbes. This is in accordance with Bukle (1987) the effects of asapcair containing compounds such as formaldehyde, phenol Acetate and has bacteria killing properties. The longer the storage of "Otak-otak"bandeng will begin to grow microbes, thus decreasing the quality. Mulyanto (1982) reported a shelf life of smoked milkfish approximately four days depending on how the fumigation.

b. **Figures rancidity (Total Barbiturie Acid)**

TBA test is a test that is specific to the oxidation of unsaturated fatty acids. Rancidity analysis carried out four days for 12 days

Table 8: Effect of concentration of liquid smoke to the number TBA Coconut shells in the "Otak-otak"bandeng

TBA numbers (ppm)	Longer Storage (Day)			
Liquid Smoke constructive retention	0	4	8	12
0%	32	68	76	92
0,25%	28	52	59	70
0,50%	22	36	42	48
0,75%	18	32	37	41
1%	12	28	32	34

Table 8 shows the greater the concentration of liquid smoke is added to the coconut shell "otak otak banding" TBA numbers will be small and the longer the deviation TBA numbers will increase. This is due in a coconut shell containing liquid smoke fenol compounds as anti-oxidants are very effective in reducing the rancidity of the "Otak-otak"bandeng.

CONCLUSION

Based on protein content, fat content and Aw, treatment of fish and Poya proportion (80%: 20%), showed the best treatment in phase 1, flavor and taste favored by customer. In stage 2 concentration of liquid smoke shells to 0.75% flavor and aroma of the most preferred by consumers and the power shelf to 8 days at room temperature.

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